



Unmanned Aerial Vehicle (UAV)

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A quadcopter drone is shown in flight against a dark blue sky. The drone has four rotors with black propellers and red motor housings. It features a central body with various electronic components, a camera mounted underneath, and four black legs. The word "Introduction" is written in large white letters on the left side of the image, with a horizontal white line below it.

Introduction

- An unmanned aerial vehicle (UAV), commonly known as a drone, is a type of aircraft that operates without a human pilot on board. UAVs are equipped with a variety of hardware components that allow them to perform various tasks, from surveillance and reconnaissance to package delivery and search and rescue operations.
- In this presentation, we will discuss some of the essential hardware components of UAVs and provide examples of each component.

Main Components

1. Frame
2. Locomotion (Motor & Propellers)
3. Control System (Flight Controllers)
4. Data Collection (Sensors)
5. Data Collection (Camera)
6. Data Transmission
7. Power Management





Parrot Bebop



Yuneec Typhoon H



DJI Phantom 4

Frame

- The frame is the physical structure of the UAV that holds all the components together.
- The frame is usually made of lightweight materials such as carbon fiber or aluminum, and it is designed to be aerodynamic and durable.

Locomotion (Motor & Propellers)

- The motors are responsible for propelling the UAV through the air. UAVs typically have four or more motors, each connected to a propeller.
- The motors are controlled by the flight controller, which determines the speed and direction of each motor.
- The propellers are attached to the motors and generate the lift required to keep the UAV in the air.
- Propellers come in various sizes and shapes, depending on the type and size of the UAV



DJI Phantom 4 4Pro
4Pro+ 9450 Quick
Release Propellers
9450S Blade



HUBSAN Propeller Set
for X4 H507A Star Pro
Drone H507A-03 B&H



BLADE BLH8612
brushless motor for
Chroma

Control System (Flight Controller)

- The flight controller is the brain of the UAV. It receives input from various sensors, including the GPS, gyroscope, and accelerometer, and determines the orientation and speed of the UAV.
- The flight controller also controls the motors and other components of the UAV.

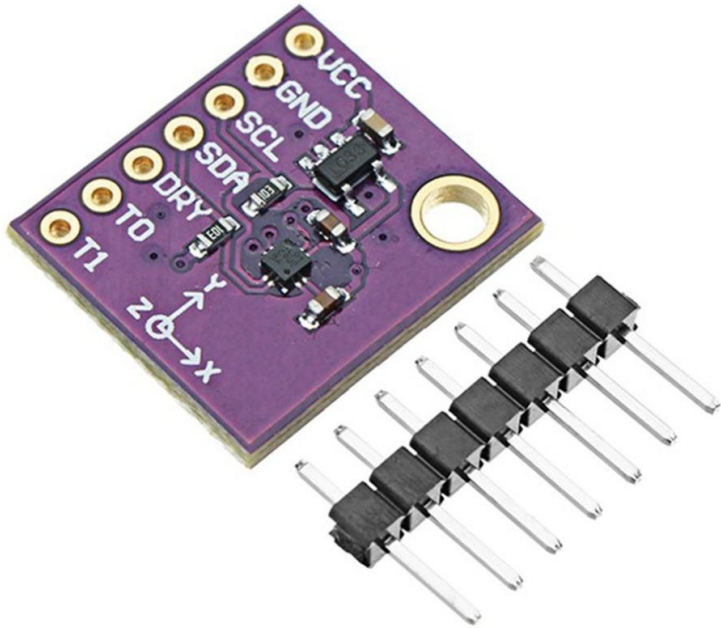
APM2.8 Flight control Straight-pin / Side-pin



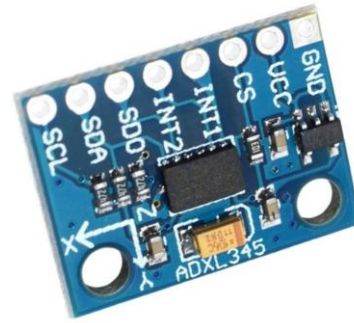
Pixhawk PX4 Autopilot



DJI NAZA-M V2



CJMCU 008 HSCDTD008A 3 Axis Magnetometer
Compass Magnetic Sensor



ADXL345 3-Axis Accelerometer Sensor Module



BMP180 Barometric
Pressure Sensor

Data Collection (Sensors)

- UAVs are equipped with various sensors that provide information about the environment, such as altitude, airspeed, and temperature.
- Sensors also provide data for navigation and obstacle avoidance.



GY-50 L3G4200D 3
Axis Digital Gyroscope
Sensor Module



GPS Module with Antenna for UAV-Tenet Auto Electronics Limited



DJI Zenmuse X5



FLIR Vue Pro R

Data Collection (Camera)

- The camera is one of the most critical components of the UAV, as it provides visual information to the operator or onboard computer.
- UAVs can be equipped with various types of cameras, including thermal, infrared, and high-definition cameras.



Spektrum DX6e



FrSky Taranis X9D Plus



DJI Lightbridge 2

Data Transmission

- The communication system allows the operator to control the UAV remotely and receive data from the UAV in real-time.
- UAVs use various communication systems, including Wi-Fi, Bluetooth, and radio frequency.

Power Management

- The battery provides power to the motors and other components of the UAV. The battery must be lightweight, durable, and have a high capacity to allow the UAV to fly for an extended period.



Tattu 1300mAh 11.1V 75C 3S1P Lipo

COMPATIBLE VERSIONS



Powerextra Phantom 4 Series Battery
15.2V 5350 mAh LiPo



DJI Intelligent Flight Battery
for Spark CP.PT.000789

A white and grey unmanned aerial vehicle (UAV) is shown in flight against a dark, hazy sky. The aircraft has a high-wing configuration, a V-shaped tail, and a sensor pod mounted on a mast in the nose. The registration 'Y-1011' is visible on the fuselage and the tail. A red warning label 'DANGER PROPELLER' is on the propeller hub. The background shows a blurred landscape with hills and some structures.

Summary

In conclusion, unmanned aerial vehicles are complex machines that require a wide range of hardware components to operate successfully. The hardware components discussed in this presentation are just a few examples of the many components that make up a UAV. Other components, such as sensors, antennas, and landing gear, are also essential to the operation of UAVs.